IN THE CLAIMS

Please amend the claims as follows:

1. (Original) Method for determining axial speed (V) of an optical lens (34) of an optical disc drive (1), wherein:

a light beam (32) is generated, directed towards the optical disc (2), and caused to reflect from the optical disc (2), wherein the light beam passes said optical lens (34);

the reflected light beam (32d) is received by an optical detector (35);

an output signal (S_R) from said optical detector (35) is processed to derive therefrom a focal error signal (FES);

said optical lens (34) is caused to move axially with respect to said optical disc (2);

an S-shaped curve (62) of the focal error signal (FES) is timed;

and the axial speed (V) of the optical lens (34) is calculated on the basis of the timing result of the S-shaped curve (62).

2. (Original) Method according to claim 1, wherein the axial speed (V) of the optical lens (34) is calculated according to the formula:

$$V = \Delta F \ / \ |t_T - t_S|$$

t_S being the time of occurrence of a first characteristic event of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the focal error signal (FES);

and ΔF being the spatial axial distance between two physical characteristics of said light beam (32) associated with said first and second characteristic events, respectively.

3. (Original) Method according to claim 2, wherein:

said first characteristic event is a maximum value of the focal error signal (FES);

said second characteristic event is a minimum value of the focal error signal (FES);

ΔF being the astigmatic focal distance of said light beam (32).

4. (Original) Method for determining the sensitivity (γ) of a focal actuator (52) of an optical disc drive (1), wherein:

a sloping control signal (S_{CF}) having a substantially constant slope is applied to the focal actuator (52) such as to cause an optical lens (34) to move axially with respect to an optical disc (2);

a light beam (32) is generated, directed towards the optical disc (2), and caused to reflect from an optical disc (2), wherein the light beam passes said optical lens (34);

the reflected light beam (32d) is received by an optical detector (35);

an output signal (S_R) from said optical detector (35) is processed to derive therefrom a focal error signal (FES);

an S-shaped curve (62) of the focal error signal (FES) is timed;

and the sensitivity (γ) of the focal actuator (52) is calculated on the basis of the timing result of the S-shaped curve (62).

5. (Original) Method according to claim 4, wherein the sensitivity (γ) of the focal actuator (52) is calculated according to the formula:

$$\gamma = \Delta F \; / \; (\; |t_T - t_S| \; * \; d(S_{CF})/dt \;)$$

$d(S_{CF})/dt$ being the time-derivative of the control signal S_{CF};

t_S being the time of occurrence of a first characteristic event of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the focal error signal (FES);

and ΔF being the spatial axial distance between two physical characteristics of said light beam (32) associated with said first and second characteristic events, respectively.

6. (Original) Method according to claim 5, wherein:

said first characteristic event is a maximum value of the focal error signal (FES);

said second characteristic event is a minimum value of the focal error signal (FES);

ΔF being the astigmatic focal distance of said light beam (32).

7. (Original) Method for determining the distance (D) between two reflective layers of an optical disc (2), wherein:

a light beam (32) is generated, directed towards the optical disc (2), and caused to reflect from the optical disc (2), wherein the light beam passes an optical lens (34);

the reflected light beam (32d) is received by an optical detector (35);

an output signal (S_R) from said optical detector (35) is processed to derive therefrom a focal error signal (FES);

said optical lens (34) is caused to move axially with respect to said optical disc (2);

the occurrence of characteristic events of S-shaped curves (62; 63) of the focal error signal (FES), associated with said two layers, is timed;

at least one S-shaped curve (62) of the focal error signal (FES) is timed;

and the distance (D) between said two reflective layers is calculated on the basis of the timing result of the S-shaped curve (62) on the one hand and on the other hand on the basis of the timing result of the characteristic events of said S-shaped curves (62; 63).

8. (Original) Method according to claim 7, wherein an axial speed (V) of the optical lens (34) is calculated according to the formula:

$$V = \Delta F / |t_T - t_S|$$

t_S being the time of occurrence of a first characteristic event of said at least one S-shaped curve (62) of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the same S-shaped curve (62) of the focal error signal (FES);

and ΔF being the spatial axial distance between two physical characteristics of said light beam (32) associated with said first and second characteristic events, respectively.

9. (Original) Method according to claim 8, wherein:

said first characteristic event is a maximum value of the S-shaped curve (62) of the focal error signal (FES);

said second characteristic event is a minimum value of the same S-shaped curve (62) of the focal error signal (FES);

ΔF being the astigmatic focal distance of said light beam (32).

10. (Original) Method according to claim 8, wherein the distance (D) is calculated in accordance with the formula:

$$D = V * \Delta t_C$$

$\Delta t_C = t_{CR} - t_{CS}$ being the time interval between said characteristic events of said two S-shaped curves (62; 63).

11. (Original) Method according to claim 10, each of said characteristic events of said two S-shaped curves (62; 63) being the zero-crossing of the corresponding S-shaped curve (62; 63).

12. (Original) Method according to claim 7, wherein the distance (D) is calculated according to the formula:

$$D = \Delta F * \Delta t_C / |t_T - t_S|$$

t_S being the time of occurrence of a first characteristic event of said at least one S-shaped curve (62) of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the same S-shaped curve (62) of the focal error signal (FES);

ΔF being the spatial axial distance between two physical characteristics of said light beam (32) associated with said first and second characteristic events, respectively;

and $\Delta t_C = t_{CR} - t_{CS}$ being the time interval between said characteristic events of said two S-shaped curves (62; 63).

13. (Original) Method according to claim 12, wherein:

said first characteristic event of said S-shaped curve (62) is a maximum value of this S-shaped curve (62);

said second characteristic event of the same S-shaped curve (62) is a minimum value of the same S-shaped curve (62);

ΔF being the astigmatic focal distance of said light beam (32);

and each of said characteristic events of said two S-shaped curves (62; 63) being the zero-crossing of the corresponding S-shaped curve (62; 63).

14. (Original) Method for recognizing type (CD; DVD) of an optical disc, wherein:

a light beam (32) is generated, directed towards the optical disc (2), and caused to reflect from the optical disc (2), wherein the light beam passes an optical lens (34);

the reflected light beam (32d) is received by an optical detector (35);

an output signal (S_R) from said optical detector (35) is processed to derive therefrom a focal error signal (FES);

said optical lens (34) is caused to move axially with respect to said optical disc (2);

the occurrence of characteristic events of S-shaped curves (62; 63) of the focal error signal (FES), associated with said two layers, is timed;

at least one S-shaped curve (62) of the focal error signal (FES) is timed;

wherein a disc type parameter (α) is calculated in accordance with the formula:

$$\alpha = \Delta t_C / (t_T - t_S)$$

t_S being the time of occurrence of a first characteristic event of said at least one S-shaped curve (62) of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the same S-shaped curve (62) of the focal error signal (FES);

$\Delta t_C = t_{CR} - t_{CS}$ being the time interval between said characteristic events of said two S-shaped curves (62; 63);

wherein the measured parameter value (α) is compared with a predetermined reference value (α_{REF}), and wherein it is decided that the optical disc is of a first type (CD) if the measured parameter value is larger than said reference value (α_{REF}), and that the optical disc is of a second type (DVD) if the measured parameter value is smaller than said reference value (α_{REF}).

15. (Original) Method according to claim 14, wherein:

said first characteristic event is a maximum value of the S-shaped curve (62) of the focal error signal (FES);

said second characteristic event is a minimum value of the same S-shaped curve (62) of the focal error signal (FES);

and each of said characteristic events of said two S-shaped curves (62; 63) being the zero-crossing of the corresponding S-shaped curve (62; 63).

16. (Original) Method for determining the distance (D) between two reflective layers of an optical disc (2), wherein:

a light beam (32) is generated, directed towards the optical disc (2), and caused to reflect from the optical disc (2), wherein the light beam passes an optical lens (34);

the reflected light beam (32d) is received by an optical detector (35);

an output signal (S_R) from said optical detector (35) is processed to derive therefrom a focal error signal (FES) and a data signal (S_D);

said optical lens (34) is caused to move axially with respect to said optical disc (2);

the occurrence of characteristic events of data signal curves (72; 73), associated with said two layers, is timed;

at least one S-shaped curve (62) of the focal error signal (FES) is timed;

and the distance (D) between said two reflective layers is calculated on the basis of the timing result of the S-shaped curve (62) on the one hand and on the other hand on the basis of the timing result of the characteristic events of said data signal curves (72; 73).

17. (Original) Method according to claim 16, wherein an axial speed (V) of the optical lens (34) is calculated according to the formula:

$$V = \Delta F / |t_T - t_S|$$

t_S being the time of occurrence of a first characteristic event of said at least one S-shaped curve (62) of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the same S-shaped curve (62) of the focal error signal (FES);

and ΔF being the spatial axial distance between two physical characteristics of said light beam (32) associated with said first and second characteristic events, respectively.

18. (Original) Method according to claim 17, wherein:

said first characteristic event is a maximum value of the S-shaped curve (62) of the focal error signal (FES);

said second characteristic event is a minimum value of the same S-shaped curve (62) of the focal error signal (FES);

ΔF being the astigmatic focal distance of said light beam (32).

19. (Original) Method according to claim 17, wherein the distance (D) is calculated in accordance with the formula:

$$D = V * \Delta t_C$$

$\Delta t_C = t_{CR} - t_{CS}$ being the time interval between said characteristic events of said data signal curves (72; 73).

20. (Original) Method according to claim 19, each of said characteristic events of said data signal curves (72; 73) being the peak of the corresponding curve (72; 73) of the low frequency part of the data signal.

21. (Original) Method according to claim 16, wherein the distance (D) is calculated according to the formula:

$$D = \Delta F * \Delta t_C / |t_T - t_S|$$

t_S being the time of occurrence of a first characteristic event of

said at least one S-shaped curve (62) of the focal error signal (FES);

t_T being the time of occurrence of a second characteristic event of the same S-shaped curve (62) of the focal error signal (FES);

ΔF being the spatial axial distance between two physical characteristics of said light beam (32) associated with said first and second characteristic events, respectively;

and $\Delta t_C = t_{CR} - t_{CS}$ being the time interval between said characteristic events of said data signal curves (72; 73).

22. (Original) Method according to claim 21, wherein:

said first characteristic event of said S-shaped curve (62) is a maximum value of this S-shaped curve (62);

said second characteristic event of the same S-shaped curve (62) is a minimum value of the same S-shaped curve (62);

ΔF being the astigmatic focal distance of said light beam (32);

and each of said characteristic events of said data signal curves (72; 73) being the peak of the corresponding curve (72; 73) of the low frequency part of the data signal.

23. (Original) Method for recognizing type (CD; DVD) of an optical disc, wherein:

a light beam (32) is generated, directed towards the optical disc (2), and caused to reflect from the optical disc (2), wherein the light beam passes an optical lens (34);

the reflected light beam (32d) is received by an optical detector (35);

an output signal (S_R) from said optical detector (35) is processed to derive therefrom a focal error signal (FES);

said optical lens (34) is caused to move axially with respect to said optical disc (2);

the occurrence of characteristic events of data signal curves (72; 73), associated with said two layers, is timed;

at least one S-shaped curve (62) of the focal error signal (FES) is timed; wherein a disc type parameter (α) is calculated in accordance with the formula:

$$\alpha = \Delta t_C / (t_T - t_S)$$

t_S being the time of occurrence of a first characteristic event of said at least one S-shaped curve (62) of the focal error signal (FES);

$_T$ being the time of occurrence of a second characteristic event of the same S-shaped curve (62) of the focal error signal (FES);

$t_C = t_{CR} - t_{CS}$ being the time interval between said characteristic events of said data signal curves (72; 73);

herein the measured parameter value (α) is compared with a predetermined reference value (α_{REF}), and wherein it is decided that the optical disc is of a first type (CD) if the measured parameter value is larger than said reference value (α_{REF}), and that the optical disc is of a second type (DVD) if the measured parameter value is smaller than said reference value (α_{REF}).

24. (Original) Method according to claim 23, wherein:

said first characteristic event is a maximum value of the S-shaped curve (62) of the focal error signal (FES);

said second characteristic event is a minimum value of the same S-shaped curve (62) of the focal error signal (FES);

and each of said characteristic events of said data signal curves (72; 73) being the peak of the corresponding curve (72; 73) of the low frequency part of the data signal.

25. (Currently amended) Method for recognizing type (CD; DVD) of an optical disc, wherein the distance (D) between two reflective layers of the optical disc (2) is measured by a method in accordance with ~~any of claims 7-13, 16-22~~ claim 7;

wherein the measured distance is compared with a predetermined reference value;

and wherein it is decided that the optical disc is of a first type (CD) if the measured distance (D) is larger than said reference value, and that the optical disc is of a second type (DVD) if the measured distance (D) is smaller than said reference value.

26. (Original) Method according to claim 25, wherein said distance (D) corresponds to the thickness of the disc, and wherein said predetermined reference value is preferably in the order of about 0.9 mm.

27. (Currently amended) Method according to claim 7 ~~or 16~~, wherein said distance (D) corresponds to the thickness of the disc.

28. (Currently amended) Disc drive apparatus (1), designed to perform a method according to ~~any of the previous claims~~ claim 1.

29. (Currently amended) Disc drive apparatus (1), designed to perform a disc type recognition method according to ~~any of the previous claims 14, 15, 23-26~~ claim 14;

wherein the disc drive apparatus (1) is adapted to handle one disc type only, and wherein the disc drive apparatus (1) rejects an inserted disc if the disc type recognition procedure reveals that the inserted disc is not a correct disc.

30. (Currently amended) Disc drive apparatus (1), designed to perform a disc type recognition method according to ~~any of the previous claims 14, 15, 23-26~~ claim 14;

wherein the disc drive apparatus (1) is adapted to handle at least two different disc types, and wherein the disc drive apparatus (1) proceeds with handling an inserted disc in accordance with the disc type as revealed by the disc type recognition procedure.